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ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/MSV/W.No.14/2018-19

Date: 25.12.2018

TEST REPORT

CLIENT	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
NAME OF THE ROAD	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
SAMPLE ID	:	Cement
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part -5)	130 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	420 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	28.00 %	-

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 25.12.2018

TEST REPORT ON FINE AGGREGATES (SAND)
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.

Agency : **Sri. M S Venkatesh,** Contractor, Bangalore.

Name of Work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.

Name of the Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.

Date of Testing : 25.12.2018

Material : Sand

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	81	8.10	8.10	91.9	90-100
2.36	150	15.00	23.10	76.9	75-100
1.18	175	17.50	40.60	59.4	55-90
600 Micron	215	21.50	62.10	37.9	35-59
300 Micron	150	15.00	77.10	22.9	8-30
150 Micron	135	13.50	90.60	9.4	0-10

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 25.12.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency : **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Date of Testing : 25.12.2018
Material : 40mm Aggregates

Total Wt. of Aggregates in gms **15000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	168	1.12	1.12	98.88	95-100
20	8320	55.47	56.59	43.41	30-70
10	3265	21.77	78.35	21.65	10-35
4.75	2640	17.60	95.95	4.05	0-5

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 25.12.2018

TEST REPORT ON COARSE AGGREGATES
IS 383-1970 (RA- 2002)

Client : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency : **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Date of Testing : 25.12.2018
Material : 20mm Aggregates

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
40	0	0	0	100	100
20	184	3.7	3.7	96.3	95-100
10	2436	48.7	52.4	47.6	25-55
4.75	2010	40.2	92.6	7.4	0-10

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 DATE : 28.12.2018

TEST REPORT ON SOLID CONCRETE BLOCKS

Client	: **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	: **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	: Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	: Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Date of Testing	: 28.12.2018
Size of Blocks	: 400mm x 200mm x 200mm
Cross Sectional Area	: 40000 mm^2
Technical Reference	: IS: 2185 (Part 1) - 2005
No. of Blocks Tested	: 04

Sl.No.	Block ID	Wt. in Kg	Failure load (KN)	Compressive strength (N/mm^2)	Requirement as per IS 2185 (Part 1) - 2005
1	Block 1	28.5	285.2	3.57	Minimum required Compressive Strength of Individual Units 3.50 N/mm^2
2	Block 2	26.9	286.5	3.58	
3	Block 3	25.8	289.3	3.62	
4	Block 4	25.3	290.2	3.63	

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 27.01.2019

TEST REPORT ON CEMENT MORTAR CUBES

Client	: **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Contractor	: **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	: Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	: Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Sample ID	: Cement Mortar
Size of cubes	: 50mmx50mmx50mm
Cross Sectional Area	: 2500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	30.12.2018	27.01.2019	0.798	12.6	5.04
2	30.12.2018	27.01.2019	0.756	13.5	5.40
3	30.12.2018	27.01.2019	0.768	13.9	5.56

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 10.01.2019

TEST REPORT ON CONCRETE CUBES

Client	: **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Contractor	: **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	: Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	: Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{15}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	03.01.2019	10.01.2019	8.136	285.6	12.69
2	03.01.2019	10.01.2019	8.120	279.6	12.43
3	03.01.2019	10.01.2019	8.115	265.3	11.79

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 31.01.2019

TEST REPORT ON CONCRETE CUBES

Client	: **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Contractor	: **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	: Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	: Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{15}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	03.01.2019	31.01.2019	8.198	405.2	18.01
2	03.01.2019	31.01.2019	8.184	389.6	17.32
3	03.01.2019	31.01.2019	8.199	396.2	17.61

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 10.02.2019

PRECAST SLAB 100mm Thick(CORE) TEST REPORT

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Contractor	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
No.of Sample Tested	:	03
Date of Testing	:	10.02.2019
Techinical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20}

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	83.00	0.385	2362.40	1.66	0.960	32.30	16.45	17.77	17.06	21.32
2	50.00	85.00	0.396	2372.72	1.70	0.960	33.50	17.06	18.43	17.69	22.11
3	50.00	87.00	0.409	2394.28	1.74	0.960	34.90	17.77	19.20	18.43	23.04

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 05.01.2019

KERB STONE (CORE) TEST REPORT

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
No.of Sample Tested	:	03
Date of Testing	:	05.01.2019
Techinical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{15}

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	73.00	0.342	2386.02	1.46	0.960	26.80	13.65	14.74	14.15	17.69
2	50.00	74.00	0.349	2401.95	1.48	0.960	28.20	14.36	15.51	14.89	18.61
3	50.00	71.00	0.329	2359.98	1.42	0.960	26.10	13.29	14.36	13.78	17.23

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JobNo: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 12.01.2019

GRADATION FOR GSB (Close Graded)
IS : 2720 (Part - 4)

Agency : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Client : **Sri. M S Venkatesh,** Contractor, Bangalore.
Name of work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Date of Testing : 12.01.2019

Oven Dry Wt (gm) : 13367

TABLE – 1

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specified Limits
53	-	-	-	100	100
26.5	1820	1820	13.62	86.38	70-100
9.5	2365	4185	31.31	68.69	50-80
4.75	2130	6315	47.24	52.76	40-65
2.36	1856	8171	61.13	38.87	30-50
0.425	2140	10311	77.14	22.86	15-25
0.075	2258	12569	94.03	5.97	3-10
PAN	798				
Total	13367				

TABLE – 2: Tests on filler screen materials (As per Table : 400-13)

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	23.00	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

Remarks: Satisfies MORTH Specifications as per Table 400-2, Grading-II

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 14.01.2019

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.

Agency : **Sri. M S Venkatesh,** Contractor, Bangalore.

Name of Work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.

Name of Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.

Date of Testing : 14.01.2019

Material Type : Wet Mix Macadam

Oven Dry.Wt 10500

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	345	345	3.3	96.7	95-100
22.4	3260	3605	34.3	65.7	60-80
11.2	1985	5590	53.2	46.8	40-60
4.75	1540	7130	67.9	32.1	25-40
2.36	1036	8166	77.8	22.2	15-30
0.600	798	8964	85.4	14.6	8-22
0.075	760	9724	92.6	7.4	0-8

Note:

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 14.01.2019

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Type of Mix	Wet Mix macadam
Date of Testing	14.01.2019

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	375	377	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	292	292	292	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.13	22.55	22.96	22.54

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 14.01.2019

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	14.01.2019

Result : Flakiness Index = **12.25%**

Elongation Index = **13.89%**

Result : Combined Flakiness & Elongation index **26.14%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date : 14.01.2019

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.

Agency : **Sri. M S Venkatesh,** Contractor, Bangalore.

Name of Work : Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.

Name of Road : Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.

Date of Testing : 14.01.2019

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	24.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 19.01.2019

TEST REPORT

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	19.01.2019

The results of the tests conducted on the bitumen sample using for Bituminous Macadam

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	66	60 to 70
2	Softening point, ^{0}C	49	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	286	Min. 220

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 19.01.2019

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	19.01.2019

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	373	375	377	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	83	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	292	292	292	
4	Aggregate Impact value = percent fines	21.72	22.13	22.55	
	$100^* (W_2/W_1)\%$				**22.13**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

Note:

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 19.01.2019

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Macadam
Date of Testing	19.01.2019

Result : Flakiness Index = **11.68%**

Elongation Index = **13.65%**

Result : Combined Flakiness & Elongation index **25.33%**

Note:

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Job No. CQCE/BBMP/MSV/W.No.14/2018-19 19.01.2019

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	19.01.2019

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2024	
2	Weight of basket suspended in water	W_2 g	754	754	754	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1266	1268	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	755	755	755	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.680	2.681	2.683	2.681
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.702	2.707	2.712	2.707
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.35%	0.40%	0.35%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Aggregate Gradation Test
IS : 2386 Part I

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	20.01.2019

5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	239	4.78	4.78	95.22	90-100	
13.2	1780	35.60	40.38	59.62	56-88	
4.75	1656	33.12	73.50	26.50	16-36	
2.36	720	14.40	87.90	12.10	4-19	
0.3	356	7.12	95.02	4.98	2-10	
0.075	80	1.60	96.62	3.38	0-8	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	365	7.30	7.30	92.70	90-100	
13.2	1420	28.40	35.70	64.30	56-88	
4.75	1629	32.58	68.28	31.72	16-36	
2.36	648	12.96	81.24	18.76	4-19	
0.3	510	10.20	91.44	8.56	2-10	
0.075	66	1.32	92.76	7.24	0-8	

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 20.01.2019

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	**Sri. M S Venkatesh,** Contractor, Bangalore.
NAME OF THE WORK	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
NAME OF THE ROAD	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
SAMPLE I/D	Sample Supplied by Agency
DATE OF TESTING	20.01.2019

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	482	483
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	18	17.00
7. Bitumen content in %	3.60	3.40
8. Average	3.50	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	40.5	8.40	8.40	91.60	90-100
13.2	143.8	29.83	38.24	61.76	56-88
4.75	168.6	34.98	73.22	26.78	16-36
2.36	55.8	11.58	84.79	15.21	4-19
0.3	33.6	6.97	91.76	8.24	2-10
0.075	8.9	1.85	93.61	6.39	0-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	35.9	7.18	7.18	92.82	90-100
13.2	155.9	31.18	38.36	61.64	56-88
4.75	172.6	34.52	72.88	27.12	16-36
2.36	84.1	16.82	89.70	10.30	4-19
0.3	33.6	6.72	96.42	3.58	2-10
0.075	7.5	1.50	97.92	2.08	0-8

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 27.01.2019

TEST REPORT

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the work	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	27.01.2019

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	66	60 to 70
2	Softening point, ^{0}C	50	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	290	Min. 220

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 Date: 27.01.2019

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	27.01.2019

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.31	22.72	**22.51**

Comments:
→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19

27.01.2019

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	27.01.2019

Result : Flakiness Index = **12.36%**

Elongation Index = **13.98%**

Result : Combined Flakiness & Elongation index **26.34%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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27.01.2019

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Type of Mix	Bituminous Concrete
Date of Testing	27.01.2019

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2019	2021	2020	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1264	1266	1265	
4	Weight of saturated surface dry aggregate in air	W_3 g	2014	2016	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	750	750	750	
6	Weight of oven dried aggregate	W_4 g	2007	2008	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.677	2.675	2.676
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.701	2.706	2.707	2.705
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.35%	0.40%	0.45%	0.40%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of theWork	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Road	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	28.01.2019

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	520	10.40	10.40	89.60	79 - 100	
9.5	479	9.58	19.98	80.02	70 - 88	
4.75	750	15.00	34.98	65.02	53 - 71	
2.36	536	10.72	45.70	54.30	42 - 58	
1.18	420	8.40	54.10	45.90	34 - 48	
0.600	668	13.36	67.46	32.54	26 - 38	
0.300	536	10.72	78.18	21.82	18 - 28	
0.150	329	6.58	84.76	15.24	12 - 20	
0.075	410	8.20	92.96	7.04	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	615	12.30	12.30	87.70	79 - 100	
9.5	485	9.70	22.00	78.00	70 - 88	
4.75	720	14.40	36.40	63.60	53 - 71	
2.36	556	11.12	47.52	52.48	42 - 58	
1.18	520	10.40	57.92	42.08	34 - 48	
0.600	685	13.70	71.62	28.38	26 - 38	
0.300	423	8.46	80.08	19.92	18 - 28	
0.150	246	4.92	85.00	15.00	12 - 20	
0.075	328	6.56	91.56	8.44	4 - 10	

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19

Date: 28.01.2019

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Sri. M S Venkatesh,** Contractor, Bangalore.
Name of the Work	:	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
Name of the Work	:	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.01.2019

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.32	9.68	9 Kn (min)
2	Marshal flow, mm	2.56	3.21	2 – 4
3	Percent air voids in Mineral Aggregate	13.98	14.15	13 – 15
4	Voids in Compacted Mix	5.63	4.25	3 – 6
5	Percent Voids filled with Bitumen	72.98	73.16	65 - 75
6	Density, g/cc	2.27	2.26	--

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Job No.: CQCE/BBMP/MSV/W.No.14/2018-19 28.01.2019

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	**Sri. M S Venkatesh,** Contractor, Bangalore.
NAME OF THE WORK	Improvements & asphalting roads at Manjunatha Nagara Tenginathot, Byraveshwaranagara, Sampangi Ramaiah Layout, main roads & cross roads of M.E.I Layout left Side, & Bagalagunte in Bagalagunte in Ward No:14 (5-Works) Package No. DZ 2017-18-(03), BBMP, Bangalore.
NAME OF THE ROAD	Improvements and Asphalting roads at Byraveshwaranagara in Bagalagunte in Ward No.14.
DATE OF TESTING	28.01.2019

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469	469.5
3. Weight of Asphalt and Mineral matter Extracted, g	31	30.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	31	30.5
7. Bitumen content in %	6.20	6.10
8. Average	6.15	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.0	100.0	100
13.2	92.5	93.6	79-100
9.5	72.8	71.6	70-88
4.75	55.6	57.1	53-71
2.36	43.3	44.8	42-58
1.18	38.9	39.2	34-48
0.6	29.6	30.1	26-38
0.3	22.5	23.6	18-28
0.15	15.8	16.4	12-20
0.075	5.9	6.8	4-10

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